

1 **In the Claims:**

- 2 1. A process for determining whether a Resource on a Cluster may be locked by a
3 First Node, wherein the Cluster includes the First Node and at least one Peer Node,
4 comprising:
5 communicating a request by a First Node to establish a lock on a Resource
6 accessible through the Cluster;
7 determining whether the at least one Peer Node on the Cluster holds an active lock
8 on the Resource;
9 if an active lock on the Resource is not held by any of the at least one Peer
10 Node, approving the lock request; and
11 if an active lock on the Resource is held by any of the at least one Peer
12 Node, further comprising:
13 determining for each active lock held on the Resource whether the
14 requested lock conflicts with the active lock;
15 if the requested lock does not conflict with the active lock, approving the
16 lock request; and
17 if the requested lock conflicts with the active lock, denying the lock
18 request.
19 2. The process of claim 1, wherein the lock request further comprises:
20 a lock name;
21 an intent mode; and
22 a deny mode, wherein the lock name provides an identification of the
23 Resource.
24 3. The process of claim 2, wherein the active lock further comprises:
25 a lock name;
26 an intent mode; and
27 a deny mode, wherein the lock name provides an identification of the
28 Resource.
29 4. The process of claim 3, wherein the determination of whether an active lock on
30 the Resource is held by any of the at least one Peer Node further comprises:
31 comparing the lock name of the requested lock with the lock name of each
32 active lock held by each of the at least one Peer Node;
33 determining that an active lock is held on the Resource if the lock name of
34 the requested lock and the lock name of any active lock held by any of the at least one

1 Peer Node identifies the same Resource; and
2 determining that an active lock is not held on the Resource if the lock
3 name of the requested lock and the lock name of every active lock held by any of the at
4 least one Peer Node does not identify the same Resource.
5 5. The process of claim 4, wherein the comparisons of the lock names are
6 accomplished at each of the at least one Peer Node and further comprise examining each
7 entry in a Lock Broker Table.
8 6. The process of claim 5, wherein each of the at least one Peer Node maintains a
9 separate Lock Broker Table.
10 7. The process of claim 3, wherein the determination of whether the requested lock
11 conflicts with the active lock further comprises:
12 comparing the intent mode of the lock request with the deny mode of the
13 active lock; and
14 comparing the deny mode of the active lock with the intent mode of the
15 lock request;
16 whereupon failure of either of the comparing steps, the lock request is
17 denied and whereupon passing of both of the comparing steps, the lock request is
18 approved.
19 8. The process of claim 7, whereupon obtaining approval of the requested lock from
20 each of the at least one Peer Node, the First Node establishes an active lock on the
21 Resource.
22 9. The process of claim 7, whereupon obtaining a denial of the lock request, the
23 process further comprises;
24 placing the lock request in a pending state at the Peer Node;
25 awaiting notification that the active lock which conflicted with the lock
26 request has been released; and
27 repeating the process identified in claim 1.
28 10. The process of claim 1, wherein the Resource further comprises:
29 at least one virtual or real device, accessible through the Cluster, selected
30 from the group consisting of: a data file, a database, a printer, a server, a display monitor,
31 a personal computer, and an element of a personal computer.
32 11. The process of claim 1, wherein the lock request further comprises a read/write
33 request.

1 12. A process for implementing a Cluster wide lock broker comprising:
2 installing a lock broker daemon on each Node of a Cluster, wherein the
3 Cluster includes at least two Nodes;
4 establishing a Lock Broker Table associated with each lock broker
5 daemon; and
6 determining whether a lock request will be granted by comparing the lock
7 request with each entry in each Lock Broker Table;
8 whereupon receiving at a First Node a request from a Client to establish a
9 lock on a Resource connected to the Cluster, the lock broker daemon communicates the
10 lock request to each Peer Node on the Cluster; and
11 whereupon receiving the lock request, each Peer Node determines whether
12 the requested lock conflicts with any active lock already held by a Client associated with
13 the Peer Node by examining the contents of the Lock Broker Table associated with the
14 lock broker daemon for the Peer Node.
15 13. The process of claim 12, wherein the process is implemented in conjunction with
16 the Cluster management system.
17 14. The process of claim 12, wherein the process further comprises inserting the lock
18 request as an active lock into the First Node's Lock Broker Table when the lock request is
19 approved by every Peer Node on the Cluster.
20 15. The process of claim 14, wherein the process further comprises removing the
21 active lock from the First Node's Lock Broker Table when the Client is finished utilizing
22 the Resource.
23 16. The process of claim 14, wherein the process further comprises deleting the active
24 lock from the First Node's Lock Broker Table when a connection between the First Node
25 and the Resource is disconnected.
26 17. A computer readable medium containing instructions for determining whether a
27 Client may establish a lock on a Resource accessible through a Cluster, wherein the
28 Client is on a First Node of the Cluster and the Resource is on a Peer Node of the Cluster,
29 by:
30 communicating a request by the Client via the First Node to establish a
31 lock on the Resource;
32 determining whether at least one Peer Node holds an active lock on the
33 Resource;
34 if an active lock on the Resource is not held by any of the at least one Peer

1 Node, approving the lock request; and
2 if an active lock on the Resource is held by any of the at least one Peer
3 Node, further comprising:
4 determining for each active lock held on the Resource whether the
5 requested lock conflicts with the active lock;
6 if the requested lock does not conflict with the active lock, approving the
7 lock request; and
8 if the requested lock conflicts with the active lock, denying the lock
9 request.
10 18. A computer readable medium containing instructions for determining whether a
11 requested lock conflicts with an active lock, wherein each of the requested lock and the
12 active lock include a lock name, identifying a Resource on a Cluster, an intent mode, and
13 a deny mode, by:
14 comparing a lock name for the requested lock against the lock name of the
15 active lock;
16 determining that an active lock is held on a Resource if the lock name of
17 the requested lock and the lock name of the active lock identify the same Resource;
18 determining that an active lock is not held on the Resource if the lock
19 name of the requested lock and the lock name of the active lock do not identify the same
20 Resource; and
21 repeating the process for each active lock held by each Peer Node on the
22 Cluster.
23 19. The computer readable medium of claim 18, wherein each active lock held by a
24 Peer Node is identified in a Lock Broker Table managed by a lock broker daemon on the
25 Peer Node and wherein the lock request is communicated to every Peer Node on the
26 Cluster for the determination of whether an active lock is held on the Resource.
27 20. The computer readable medium of claim 19, wherein the instructions further
28 include determining whether a conflict exists between the requested lock and an active
29 lock when a determination has been made that an active lock is held on the Resource, by:
30 comparing an intent mode of the lock request with a deny mode of the
31 active lock; and
32 comparing a deny mode of the active lock with an intent mode of the lock
33 request;
34 whereupon failure of either of the comparing steps, the Peer Node associated with the

